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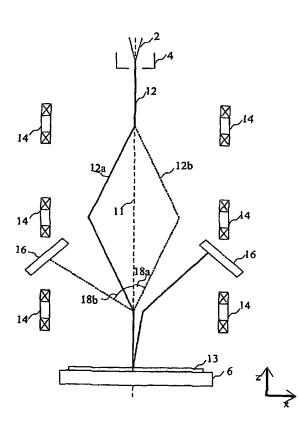
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(54) Title: CHARGED PARTICLE BEAM DEVICE



(57) Abstract: The invention provides a charged particle beam device and a method of operation thereof. An emitter (2) emits a primary charged particle beam (12). Depending on the action of a deflection system, which comprises at least three deflection stages (14), it can be switched between at least two detection units (16, 44). Further, beam shaping means (15, 41) is provided and a lens for focusing at the primary charged particle beam on a specimen.

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| C. DOCUM | ENTS CONSIDERED TO BE RELEVANT | | | | | | |
| Category ° | | | | _ | | | |
| | Citation of document, with indication, where appropriate, of t | he relevant passages | Relevant to claim No. | _ | | | |
| X | US 5 578 821 A (MEISBERGER DAN 26 November 1996 (1996-11-26) column 7, line 65 - column 13, | - | 1,2,10, 15 | | | | |
| | figures 4.5 | 11ne 21 | 1 | | | | |
| Α | , ,,,, | | 10.00 | | | | |
| x | 110 2 714 400 4 (2000) | | 18,20 | | | | |
| ^ | US 3 714 422 A (OKANO H ET AL) 30 January 1973 (1973-01-30) | | 1-3,7, 10, | | | | |
| | column 3, line 32 - column 5, figures | line 62 | 13-17,20 | | | | |
| A | US 2002/088941 A1 (YONEZAWA AK 11 July 2002 (2002-07-11) | 1-3,7, | | | | | |
| | paragraph '0050! - paragraph '(figure 1 | 10, 13-17,20 | | | | | |
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| | | | | 1 | | | |
| | er documents are listed in the continuation of box C. | X Patent family mer | nbers are listed in annex. | 7 | | | |
| | egories of cited documents ; | *T* later document publish | ed after the international filing date | - | | | |
| | t defining the general state of the art which is not red to be of particular relevance | | net after the international filing date of the conflict with the application but the principle or theory underlying the | | | | |
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/EP2004/002841

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|----|--------------------------------------|----|---------------------|----------------------------|---|-------------------|--|
| | atent document d in search report | | Publication date | | Patent family member(s) | | Publication date |
| US | 5578821 | A | 26-11-1996 | JP JP JP US US | 6188294 2002250707 2003215067 5717204 5665968 | A A A | 08-07-1994 06-09-2002 30-07-2003 10-02-1998 09-09-1997 |
| US | 3714422 | Α | 30-01-1973 | NONE | | | — — — — — — — — — — — — — — — — — — — |
| US | 2002088941 | A1 | 11-07-2002 | JP | 2003068241 | Α | 07-03-2003 |
| US | 2002088941 | A1 | 11-07-2002 | JP | 2003068241 | Α | 07-03 |